Volume Contents

Number 1 — January

		PAPERS
C. C. Hang, K. W. Lim and B. W. Chong	1	**A Dual-rate Adaptive Digital Smith Predictor**
S. A. Hall	17	**Real-time Control of a Nonlinear Electromagnetic Actuator**
G. A. Dumont, J. M. Martin-Sánchez and C. C. Zervos	33	**Comparison of an Auto-tuned PID Regulator and an Adaptive Predictive Control System on an Industrial Bleach Plant**
M. J. Grimble, S. De La Salle and D. Ho	41	**Relationship Between Internal Model Control and LQG Controller Structures**
D. Ghosh and C. H. Knapp	55	**Measurement Selection for Linear Multivariable Control Systems**
H. K. Khalil and Y.-N. Hu	65	**Steering Control of Singularly Perturbed Systems: a Composite Control Approach**
S.-C. Chang, T.-S. Chang and P. B. Luh	77	**A Hierarchical Decomposition for Large-scale Optimal Control Problems with Parallel Processing Structure**
M. Deistler and M. Gevers	87	**Properties of the Parametrization of Monic ARMA Systems**
		BRIEF PAPERS
M. Parlar	97	**Solving Dynamic Optimization Problems on a Personal Computer using an Electronic Spreadsheet**
O. Begovich and R. Ortega	103	**Adaptive Head Control of a Hydraulic Open Channel Model**
A. Vicino	109	**Robustness of Pole Location in Perturbed Systems**
Y. C. Soh and R. J. Evans	115	**Characterization of Robust Controllers**
S. Skogestad and M. Morari	119	**Robust Performance of Decentralized Control Systems by Independent Designs**
J. L. Willems	127	**Time-varying Feedback for the Stabilization of Fixed Modes in Decentralized Control Systems**
M. Ulm and H.-D. Wend	133	**A Concept for Parameter Independent Evaluation of Decentralized Stabilizability**
J. L. Calvet and A. Titli	137	**Overlapping vs Partitioning in Block-iteration Methods: Application in Large-scale System Theory**
L. Guo, H.-F. Chen and J.-F. Zhang	147	**Consistent Order Estimation for Linear Stochastic Feedback Control Systems (CARMA Model)**
		TECHNICAL COMMUNIQUE
R. H. Kwong and T. J. Richardson	153	**Comments on: "Existence Conditions of Positive-definite Solutions for Algebraic Matrix Riccati Equations"**
		BOOK REVIEWS
P. C. Parks	155	**Stability of Adaptive Systems: Passivity and Averaging Analysis by B. D. O. Anderson, R. R. Bitmead, C. R. Johnson, Jr, P. V. Kokotovic, R. L. Kosut, I. M. Y. Mareels, L. Praly and B. D. Riedle**
A. P. Sage	156	**Linear Control Systems—a Computer-aided Approach by M. Jamshidi and M. Malek-Zavarei**
	159	*Biographical Notes on Contributors to this Issue*

Number 2 — March

		PAPERS
A. G. J. MacFarlane, G. Gruebel and J. Ackermann	165	**Future Design Environments for Control Engineering**
M. Papageorgiou and A. Messmer	177	**Flow Control of a Long River Stretch**
Y. Nakamori	185	**Development and Application of an Interactive Modeling Support System**
L. Pau	207	**Knowledge Representation Approaches in Sensor Fusion**
D.-W. Gu, M. C. Tsai and I. Postlethwaite	215	**An Algorithm for Super-optimal H^∞ Design: the Two-block Case**
J. L. Menaldi and M. I. Taksar	223	**Optimal Correction Problem of a Multidimensional Stochastic System**
P. Tatjewski	233	**New Dual-type Decomposition Algorithm for Nonconvex Separable Optimization Problems**
		BRIEF PAPERS
G. Yi, Y. B. Hwang, H. N. Chang and K. S. Lee	243	**Computer Control of Cell Mass Concentration in Continuous Culture**
G. Baoping and H. Baosheng	251	**The Application and Expansion of the Input–Output Consumption-tracking Control Model**
G. Roppenecker and J. O'Reilly	259	**Parametric Output Feedback Controller Design**
A. F. Vaz and E. J. Davison	267	**The Structured Robust Decentralized Servomechanism Problem for Interconnected Systems**
J. Maršík and V. Strejc	273	**Application of Identification-free Algorithms for Adaptive Control**
J. C. Engwerda and P. W. Otter	279	**On the Choice of Weighting Matrices in the Minimum Variance Controller**
P. A. Ioannou and G. Tao	287	**Dominant Richness and Improvement of Performance of Robust Adaptive Control**
J. C. Geromel	293	**Global Optimization of Measurement Strategies for Linear Stochastic Systems**
K. Khorasani	301	**A Slow Manifold Approach to Linear Equivalents of Nonlinear Singularly Perturbed Systems**
C. Kambhampati, J. E. Ellis and P. D. Roberts	307	**Generalization of Integrated System Optimization and Parameter Estimation Techniques**
H. A. Barker, M. Chen, P. W. Grant, C. P. Jobling and P. Townsend	311	**A Man–Machine Interface for Computer-aided Design and Simulation of Control Systems**
		TECHNICAL COMMUNIQUE
G. E. Young and X. J. Tao	317	**A Short-cut to the Mobius Transformation with a Recursive Algorithm**
		BOOK REVIEWS
W. Ehrenberger	321	**Reliability of Computers and Control Systems by N. Viswanadham, V. V. S. Sarma and M. G. Singh**
V. Kucera	322	**Control System Design: Conventional, Algebraic and Optimal Methods by Chi-Tsong Chen**
B. Schmidtbauer	323	**Microprocessor-based Control Systems by N. K. Sinha**
	325	*Biographical Notes on Contributors to this Issue*

Number 3 — May

		EDITORIAL
G. S. Axelby and P. C. Parks	333	**Two Golden Jubilees**
		SURVEY PAPER
C. E. García, D. M. Prett and M. Morari	335	**Model Predictive Control: Theory and Practice—a Survey**

PAPERS

S. T. Weingaertner and A. H. Levis 349 **Analysis of Decision Aiding in Submarine Emergency Decisionmaking**

K. C. Chang and Y. Bar-Shalom 359 **Distributed Adaptive Estimation with Probabilistic Data Association**

B. R. Barmish and Z. Shi 371 **Robust Stability of Perturbed Systems with Time Delays**

L. Pronzato and E. Walter 383 **Experiment Design in a Bounded-error Context: Comparison with *D*-Optimality**

Z. Kowalczuk 393 **Finite Register Length Issue in the Digital Implementation of Discrete PID Algorithms**

BRIEF PAPERS

D. W. Pessen 407 **Ladder-diagram Design for Programmable Controllers**

D. M. Stimler 413 **Scheduling Turbofan Engine Control Set Points by Semi-infinite Optimization**

M. S. Mahmoud 421 **Dynamic Decentralized Stabilization for a Class of Multi-stage Processes**

P. Dorato, H.-B. Park and Y. Li 427 **An Algorithm for Interpolation with Units in H^∞, with Applications to Feedback Stabilization**

B.-S. Chen and T.-Y. Dong 431 **LQG Optimal Control System Design Under Plant Perturbation and Noise Uncertainty: a State-space Approach**

M. H. Verhaegen 437 **Round-off Error Propagation in Four Generally-applicable, Recursive, Least-squares Estimation Schemes**

L. Wehenkel, Th. Van Cutsem and M. Ribbens-Pavella 445 **Inductive Inference Applied to On-line Transient Stability Assessment of Electric Power Systems**

D. J. Hill and C. N. Chong 453 **Lyapunov Functions of Lur'e–Postnikov Form for Structure Preserving Models of Power Systems**

G. N. Saridis 461 **Analytic Formulation of the Principle of Increasing Precision with Decreasing Intelligence for Intelligent Machines**

J. J. Buckley and H. Ying 469 **Fuzzy Controller Theory: Limit Theorems for Linear Fuzzy Control Rules**

BOOK REVIEWS

D. Kraft 473 **Optimal Control and Stochastic Estimation, Volumes 1 and 2 by M. J. Grimble and M. A. Johnson**

N. K. Sinha 475 **System Identification—Theory for the User by Lennart Ljung**

P. J. Gawthrop 476 **Identification of Continuous Systems by H. Unbehauen and G. P. Rao**

Cs. Bányász 478 **Continuous-time Self-tuning Control. Volume 1—Design by P. J. Gawthrop**

481 *Biographical Notes on Contributors to this Issue*

Number 4 — July

PAPERS

T. B. Sheridan 487 **Telerobotics**

J.-J. E. Slotine and W. Li 509 **Composite Adaptive Control of Robot Manipulators**

E. Mosca, G. Zappa and J. M. Lemos 521 **Robustness of Multipredictor Adaptive Regulators: MUSMAR**

T. Yoshida and K. A. Loparo 531 **Quadratic Regulatory Theory for Analytic Non-linear Systems with Additive Controls**

S. S. Stanković and D. D. Šiljak 545 **Sequential LQG Optimization of Hierarchically Structured Systems**

J. Lunze 561 **Stability Analysis of Large-scale Systems Composed of Strongly Coupled Similar Subsystems**

B. Kuipers 571 **Qualitative Reasoning: Modeling and Simulation with Incomplete Knowledge**

BRIEF PAPERS

V. Kaitala 587 Nonuniqueness of No-memory Feedback Equilibria in a Fishery Resource Game

J. Zhang and S. Lang 593 Explicit Self-tuning Control for a Class of Non-linear Systems

M. Niedźwiecki 597 Steady-state and Parameter Tracking Properties of Self-tuning Minimum Variance Regulators

W. Gersch and G. Kitagawa 603 Smoothness Priors Transfer Function Estimation

R. M. Canetti and M. D. España 609 Convergence Analysis of the Least-squares Identification Algorithm with a Variable Forgetting Factor for Time-varying Linear Systems

H. Dai, N. K. Sinha and S. C. Puthenpura 613 Robust Combined Estimation of States and Parameters of Bilinear Systems

K. Demirbaş 617 Multidimensional State Estimation using Stacks for Dynamic Systems with Interference

M. Sznaier and M. J. Damborg 623 Control of Constrained Discrete Time Linear Systems Using Quantized Controls

C. Ganesh and J. B. Pearson 629 H^2-Optimization with Stable Controllers

M. J. Grimble 635 Minimization of a Combined H_∞ and LQG Cost-function for a Two-degrees-of-freedom Control Design

BOOK REVIEWS

A. Bagchi 639 Stochastic Differential Systems—Analysis and Filtering by V. S. Pugachev and I. N. Sinitsyn

S. Pohjolainen 640 Mobile Control of Distributed Parameter Systems by A. G. Butkovskiy and L. M. Pustyl'nikov

G. Weir 642 Tasks, Errors and Mental Models by L. P. Goodstein, H. B. Andersen and S. E. Olsen

645 *Biographical Notes on Contributors to this Issue*

Number 5 — September

SURVEY PAPER

R. Ortega and Y. Tang 651 Robustness of Adaptive Controllers—a Survey

PAPERS

R. Bansal and T. Başar 679 Simultaneous Design of Measurement and Control Strategies for Stochastic Systems with Feedback

S. Wegrzyn, J. C. Gille and P. Vidal 695 A Model for Developmental Systems—I. Generating Word Without any Operating System

J. C. Gille, S. Wegrzyn and P. Vidal 707 A Model for Developmental Systems—II. Generating Word With an Operating System

O. K. Kwon, W. H. Kwon and K. S. Lee 715 FIR Filters and Recursive Forms for Discrete-time State-Space Models

L. Saydy and G. L. Blankenship 729 A Bound Approach to Asymptotic Optimality in Non-linear Filtering of Diffusion Processes

BRIEF PAPERS

R. Tenno, R. Vilu and H. Oit 739 Stochastic Control for Stabilization of Sludge Loading Characteristics in an Aerobic Waste Water Treatment System

M. Bryds, P. D. Roberts, M. M. Badi, I. C. Kokkinos and N. Abdullah 743 Double Loop Iterative Strategies for Hierarchical Control of Industrial Processes

P. Albertos and R. Ortega 753 On Generalized Predictive Control: Two Alternative Formulations

F. Casiello and K. A. Loparo 757 Optimal Policies for Passive Learning Controllers

S. Van Huffel and J. Vandewalle 765 On the Accuracy of Total Least Squares and Least Squares Techniques in the Presence of Errors on all Data

D. Hinrichsen, B. Kelb and A. Linnemann	771	**An Algorithm for the Computation of the Structured Complex Stability Radius**
G. Gu and E. B. Lee	777	**Stability Testing of Time Delay Systems**
A. W. Berger and F. C. Schweppe	781	**Existence of Coordinating Prices in Dynamic Systems**
		BOOK REVIEWS
H. Tolle	785	**Robot Dynamics Algorithms by Roy Featherstone**
H. J. Zimmermann	787	**Fuzzy Sets and Applications: Selected Papers by L. Zadeh by R. R. Yager, S. Ovchinnikov, R. M. Tong and H. T. Nguyen**
A. Halme	788	**Discrete-time Control Systems by K. Ogata**
B. Wittenmark	789	**Process Control Systems, Application, Design and Tuning, 3rd Ed. by F. G. Shinskey**
H.-H. Wilfert	790	**Mess- und Regelungstechnik. Mathematische Grundlagen, Entwurfsmethoden, Beispiele by Hans P. Geering**
	791	*Biographical Notes on Contributors to this Issue*

Number 6 — November

P. Eykhoff and P. C. Parks	797	**Announcement: Special Issue of *Automatica* on "Identification and Systems Parameter Estimation"**
K. J. Åström	798	**Announcement: *Automatica* Prize Paper Awards**
		EXPERT, KNOWLEDGE-BASED SYSTEMS
R. Doraiswami and J. Jiang	799	**Performance Monitoring in Expert Control Systems**
K.-E. Årzén	813	**An Architecture for Expert System Based Feedback Control**
J. L. Alty and G. Johannsen	829	**Knowledge-based Dialogue for Dynamic Systems**
		PAPERS
D. Metz and D. Williams	841	**Near Time-optimal Control of Racing Vehicles**
D. W. Clarke and C. Mohtadi	859	**Properties of Generalized Predictive Control**
R. Ortega and M. W. Spong	877	**Adaptive Motion Control of Rigid Robots: a Tutorial**
R. H. Middleton, G. C. Goodwin and Y. Wang	889	**On the Robustness of Adaptive Controllers Using Relative Deadzones**
B. Pourbabai	897	**Optimal Selection of Buffers in a Tandem Finite Capacity *G/M/1* Queueing System**
S. Li and Y.-C. Ho	907	**Sample Path and Performance Homogeneity of Discrete Event Dynamic Systems**
		BRIEF PAPERS
K. Y. Choi and D. N. Butala	917	**Synthesis of Open-loop Controls for Semibatch Copolymerization Reactors by Inverse Feedback Control Method**
J. B. Moore and L. Xia	925	**On a Class of Stabilizing Partially Decentralized Controllers**
R. I. Badr, M. F. Hassan, J. Bernussou and A. Y. Bilal	935	**Stability and Performance Robustness for Multivariable Linear Systems**
C. Wen and D. J. Hill	943	**Robustness of Adaptive Control Without Deadzones, Data Normalization or Persistence of Excitation**
E. Walter, L. Pronzato and A. Venot	949	**Theoretical Properties of Sign Change Criteria for Robust Off-line Estimation**
		BOOK REVIEWS
B. Lennartson	953	**Singular Perturbation Methods in Control: Analysis and Design by Petar Kokotović, Hassan K. Khalil and John O'Reilly**

F. J. Evans 955 **Multivariable Control—a Graph Theoretic Approach by K. J. Reinschke**

M. Thoma 956 **Multivariable Control for Industrial Application by John O'Reilly (Editor)**

D. Franke 957 **Sensors and Controls in the Analysis of Distributed Systems by A. El Jai and A. J. Pritchard**

959 *List of Reviewers for* **Automatica**, 1988

963 *Biographical Notes on Contributors to this Issue*

i *Index to Volume* 25 (1989)